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REPORT
of

THE ARMY AIR FORCES BOARD
ORLANDO, FLORIDA

TESTS CONDUCTED BY
AAF TACTICAL CENTER
ORLANDO, FLORIDA

Pinecastle Jeep Range
(Army Air Forces Board 196)
SUBJECT

DISSEMINATION OF D.D.T. FROM STANDARD BRITISH EQUIPMENT

PROJECT No 3735BH725

DATE 26 April 1945

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THE ARMY AIR FORCES BOARD
Orlando, Florida

JRVD/TJC/gb-F

26 April 1945

ARMY AIR FORCES BOARD PROJECT NO. 3735BH725

DISSEMINATION OF DDT FROM STANDARD BRITISH EQUIPMENT

I. OBJECT:

To determine the practicability of disseminating insecticide DDT from aircraft with the standard British 500 lb. S.C.I. (Smoke Curtain Installation) tank.

II. FACTUAL DATA:

a. The equipment tested under this project was the standard British 500 lb. S.C.I. (Smoke Curtain Installation) bomb bay spray tank. The capacity of this tank is 25 Imperial or approximately 30 U. S. Gallons. The tank body has an overall length of 66 inches and is 13 inches in diameter. The discharge pipe, which is located below the tank but forms a part thereof, is 2½ inches in diameter at the extreme outlet orifice and 3 inches in diameter at the point of junction with the tank. The air inlet pipe on top of the tank is 1 inch in diameter at the end and 2" in diameter at the point of junction with the tank.

The contents of the tank are discharged by breaking the glass closure plates installed in the air inlet and outlet pipes by detonators fired by electric circuit connected to a switch in the cockpit. The chemical filling flows from the tank by dynamic air pressure and gravity.

The empty tank weighs approximately 125 pounds. Filled with DDT solution in #2 Diesel oil it weighs approximately 350 pounds.

b. Standard U. S. M-10 airplane smoke tanks were also used in the tests for purpose of comparison and evaluation with relation to results in disseminating DDT with the M-10 A.P.S.T. in AAF Board Project No. F-3486, entitled "Test to Determine the Most Practical Means of Disseminating Insecticide DDT from Aircraft."

c. A-20G and A-26 aircraft were used in the tests. The British 500 lb. S.C.I. tank was modified for carrying on the wing racks of both types aircraft for the purpose of these tests.

d. Insecticide DDT.- Pure DDT is a white crystalline substance, correctly named 2,2 - bis (p - chlorophenyl) 1.1.1. - trichlorethane.

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e. Dye.- Anthraquinone blue, AB base dye and DuPont oil red No. 5076 were used on this project.

f. Solvent for DDT.- No. 2 diesel fuel oil was used as the solvent for DDT in 5% solution. On all tests with 10% solution of DDT, 20% W/v of Barrett's Heavy Solvent was used as an auxiliary solvent (Test No. 7 - Third Event excepted).

g. For the purpose of these tests, and in the absence of appropriate British aircraft, for which the British 500 lb. S.C.I. was designed, subject tank was modified for carrying on the wing racks of A-20G and A-26 aircraft.

h. The tests under this project were conducted by AAF Tactical Center, Orlando, Florida, with the assistance of the Bureau of Entomology and Plant Quarantine of the U. S. Department of Agriculture, Orlando, Florida, and the Chemical Warfare Service, Dugway Proving Ground Mobile Unit, Bushnell, Florida. Tests under Events I and II were performed on Lake Hart near Orlando, Florida. All other tests were performed at the Chemical Warfare Demonstration Range, AFTAC, Orlando, Florida.

III. CONCLUSIONS: It is concluded that:

a. The British 500 lb. S.C.I. (Smoke Curtain Installation) tank is a satisfactory unit for disseminating insecticide DDT from aircraft.

b. The capacity of subject tank is 25 Imperial or 30 U. S. gallons.

c. The time of discharge, rate of flow and approximate length of spray pattern of a single British 500 lb. S.C.I. tank, filled with 25 Imperial or 30 U. S. gallons, of DDT solution in No. 2 Fuel Oil, discharged at an I.A.S. of 240 m.p.h. are as follows:

	British 500 lb. S. C. I.
Time of Discharge -	16 seconds
Rate of flow -	1.875 gallons/second
Approximate Length of Pattern -	1880 yards

d. The use of 10% solutions of DDT in subject tank gave far better results than five percent solutions. Five percent solutions of DDT are, however, more practical for use in the field in that no auxiliary solvents are required. Ten percent solutions of DDT require the use of auxiliary solvents which are, at the present time, not available in most theatres.

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e. Based on the above tests, the optimum altitude of spraying with subject tank filled with 5% solutions of DDT in crosswinds of moderate velocities (2 to 11 m.p.h.) appears to be approximately 150 feet. With 10% solutions of DDT satisfactory results were obtained by spraying from 50 to 300 feet in crosswinds of moderate velocity.

f. The exact effective length of the pattern produced by a single British 500 lb. S.C.I. is not known on a basis of observed insect kill. Based on time of discharge and speed of aircraft, it is estimated to be approximately 1880 yards.

g. The average effective width of the pattern produced under optimum conditions by the British 500 lb. S.C.I. was approximately 200 yards. Based on this pattern width and the estimated length of 1880 yards, a single British 500 lb. S.C.I. should, at normal operating speeds of approximately 200 m.p.h., cover approximately 78 acres and effect a distribution of about 1.5 quarts per acre.

IV. RECOMMENDATIONS: It is recommended that:

a. For dissemination of 5% solutions of DDT with the British S.C.I., the contents be released at an approximate altitude of 150 feet in crosswinds of moderate velocities (2 to 12 m.p.h.) at normal operating speeds.

b. The distance between lines of flight for continuous treatment of an area by successive flights be not more than 200 yards and preferably about 175 yards.

V. DISCUSSION:

a. Methods of Testing.- (1) First Event.- This test was conducted by spraying parallel patterns on the surface of a lake from both the British S.C.I. and the U.S. M10 tanks for the purpose of obtaining a comparison of the patterns of spray from the two tanks. Spraying was done from an altitude of 25 feet at an I.A.S. of 240 m.p.h.

Although this procedure was repeated five times, no photographs were obtained that could be considered satisfactory for evaluation. For this reason, the pattern length was approximated from the time of discharge of the tank. The estimated length of the patterns of the tanks are as follows:

British S.C.I.	1800 yards
U. S. M10	600 yards

NOTE: At the time the above tests were being conducted, the mosquito population was inadequate to permit actual spray runs to determine

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effective pattern length and facilities were not available to permit use of entomological sample stations over the entire length of the spray pattern.

(2) Second Event.- This test was conducted by spraying parallel patterns on the surface of a lake from both the British S.C.I. and U. S. M10 tanks. Spraying was done at an altitude of 200 feet at an I.A.S. of 240 m.p.h. No photographs were obtained that were satisfactory for the purpose of evaluation.

(3) Third Event.- This test was conducted using mosquito larvae and flies. A range was laid out with parallel lines of stations, the lines being 200 yards apart. All stations on each line were fifty yards apart. At each station on line A was placed a container of mosquito larvae to determine percentage of kill; a petrie dish to obtain a deposit for subsequent laboratory testing for data on fly kill; a microscopic slide coated with magnesium oxide to obtain data on droplet size; and a round white enameled plate to obtain data on density of spray. In addition to the above, at each station on line B was placed a cage containing live flies. (See Incl. 5 and Photographs Nos. 5, 6 and 7, Incl. 6).

Meteorological equipment was set up to determine temperature, wind velocity, wind direction and relative humidity. (See Photograph 5, Incl. 6). The flight path in all cases was cross-wind, approximately 90° to the two lines of stations. The DDT spray was carried by the wind and deposited in the area covered by the stations. The altitudes flown were 300 feet, 150 feet, and 50 feet.

These tests were conducted to determine the following:

(a) Effective pattern width.

(b) Percentage of fly kill.

(c) Percentage of mosquito larvae kill.

(d) Particle (droplet) size.

(e) Quantity of DDT per square meter.

Test No. 1.- This test was conducted at an altitude of three hundred (300) feet. The S.C.I. contained 5% DDT in #2 fuel oil. The most effective portion of the pattern varied from two hundred (200) yards in width at line A to two hundred fifty (250) yards at line B.

(a) Percentage of fly kill.

Line A - Stations on line A did not contain flies in cages. On this line, petrie dishes were contaminated by DDT spray,

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and flies were placed in these dishes in the laboratory. 100% of flies exposed to dishes from stations #1 to 11 were killed in eight (8) to twenty five (25) minutes after exposure. (Station #3 excepted) (See Incl. 8).

Line B - Stations on line B contained both live flies in cages and petrie dishes. 100% of flies exposed to petrie dishes from stations #1 to 13 were killed in eleven (11) to sixty six (66) minutes after exposure. The percentage of flies in cages that were killed varied from 17% to 100%. (See Incl. 8).

(b) Percentage of mosquito larvae kill.

Line A - The percentage of mosquito larvae kill was highest at stations #1 to 7. The kill varied from 25% to 95% at these stations. (See Incl. 8).

Line B - The percentage of mosquito larvae kill was best at stations #1 to 11. The kill varied from 30% to 100% at these stations. (See Incl. 8).

(c) Particle (Droplet) size.

Line A - Particle size in microns varied from two hundred eighty-two (282) microns at stations #3 to six hundred fifty (650) microns at station #9. The size of practically all particles recorded varied from two hundred (200) to eight hundred (800) microns. (See Incl. 8).

Line B - Data on particle size is not available for this line of stations.

(d) Milligrams of DDT per square meter.

Line A - The number of milligrams of DDT per square meter varied from 1.1 mg to 4.2 mg. This was from stations #1 to 11 inclusive, with the heaviest deposit of DDT at stations #3. (See Incl.9).

Line B - The number of milligrams of DDT per square meter varied from 3.3 mg to 9.3 mg. This was from stations #1 to 11 inclusive, with the heaviest deposit at station #5. (See Incl. 9).

Test No. 2.- This test was conducted at an altitude of three hundred (300) feet. S.C.I. contained 5% DDT in No. 2 fuel oil. The most effective portion of the pattern was less than fifty (50) yards wide at Line A and fifty (50) yards wide at Line B.

(a) Percentage of fly kill.

Line A - Stations on line A did not contain flies in cages. On this line, petrie dishes were contaminated by DDT spray,

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and flies were placed in these dishes in the laboratory. 100% of flies exposed to dishes from stations No. 1 to 3 were killed in 26 to 97 minutes. (See Incl. 8).

Line B - Stations on Line B contained both live flies in cages and petrie dishes. 100% of flies exposed to petrie dishes were not killed in less than 240 minutes, except at station No. 5 where 90% were killed in 122 minutes. The percentage of flies in cages that were killed was less than 45% at all stations (See Incl. 8).

(b) Percentage of mosquito larvae kill.

Line A - The percentage of mosquito larvae kill was high at station No. 7 only. (90%). (See Incl. 8).

Line B - The percentage of mosquito larvae kill was high at stations No. 1 (100%) and No. 3 (90%). At all other stations, the kill was less than 66%. (See Incl. 8).

(c) Particle (Droplet) size.

Line A - Particle size in microns varied from 242 microns at station No. 1 to 132 microns at station No. 9. The size of all particles recorded was below 400 microns. (See Incl. 8).

Line B - Particle size in microns varied from 220 microns to 110 microns. The size of all particles recorded was below 400 microns. (See Incl. 8).

(d) Milligrams of DDT per square meter.

Line A - The number of milligrams of DDT per square meter varied from 0.2 to 11.1 mg. This was from stations No. 1 to 15 inclusive, with the heaviest deposit at station No. 1. (See Incl. 9).

Line B - The number of milligrams of DDT per square meter varied from 0.2 to 1.0 mg. This was from stations No. 1 to 15 inclusive, with the heaviest deposit at station #3. (See Incl. 9).

Test No. 3.- This test was conducted at an altitude of 300 feet. The S.C.I. contained 10% DDT in No. 2 fuel oil with 20% Barrett's Heavy Solvent added as an auxiliary solvent. The most effective portion of the pattern was between 150 and 250 yards wide at Line A and between 200 and 300 yards wide at Line B.

(a) Percentage of Fly Kill.

Line A - Stations on Line A did not contain flies in cages. On this line, petrie dishes were contaminated by DDT spray, and flies were placed in these dishes in the laboratory. 100% of flies exposed to dishes from stations No. 5 to 17 were killed in 26 to 1[illegible] minutes. (See Incl. 8).

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Line B - Stations on Line B contained both live flies in cages and petrie dishes. 100% of flies exposed to dishes from stations #3 to 17 were killed in 12 to 50 minutes. The percentage of flies in cages that were killed varied from 93% to 98% at stations No. 5 to 17 with 85% kill at station No. 9. (See Incl. 8).

(b) Percentage of mosquito larvae kill.

Line A - The percentage of mosquito larvae kill was highest at stations #1 to 7. 100% kill recorded at stations 1 to 5 and 90% kill at No. 7. (See Incl. 8).

Line B - The percentage of mosquito larvae kill was highest at stations No. 5 to 11. 90% to 100% kill recorded with 75% kill at No. 9. (See Incl. 8).

(c) Particle (Droplet) size.

Line A - Particle size in microns varied from 154 microns at station No. 11 to 418 microns at station No. 13. All particles recorded were below 419 microns. (See Incl. 8).

Line B - Particle size in microns varied from 418 microns at station No. 11 to 528 microns at station No. 15. All particles recorded were below 800 microns. (See Incl. 8).

(d) Milligrams of DDT Per Square Meter.

Line A - The number of milligrams of DDT per square meter varied from 1.9 to 82.8 mg. This was from station No. 1 to 17 inclusive, with the heaviest deposit at station No. 17. (See Incl. 9).

Line B - The number of milligrams of DDT per scuare meter varied from 0.7 mg to 9.9 mg. This was from station No. 1 to 17 inclusive with the heaviest deposit at station No. 11. (See Incl. 9).

Test No. 4.- This test was conducted at an altitude of 300 feet. The S.C.I. contained 10% DDT in #2 fuel oil with 20% Barrett's heavy solvent added as an auxiliary solvent. The most effective portion of the pattern was 350 yards wide at line A and between 150 and 300 yards wide at line B.

(a) Percentage of fly kill.

Line A - Stations on line A did not contain flies in cages. On this line, petrie dishes were contaminated by DDT spray, and flies were placed in these dishes in the laboratory. 100% of flies exposed to dishes from stations 1 to 17 were killed in 10 to 25 minutes. (See Incl. 8).

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Line B - Stations on line B contained both live flies in cages and petrie dishes. 100% of flies exposed to dishes from stations No. 1 to 17 were killed in 12 to 31 minutes. The percentage of flies in cages that were killed was 100% from stations No. 5 to 17 inclusive. (See Incl. 8).

(b) Percentage of mosquito larvae kill.

Line A - The percentage of mosquito larvae kill was 100% at stations No. 5 to 17 inclusive with 90% kill at No. 3. (See Incl. 8).

Line B - The percentage of mosquito larvae kill was 100% from station No. 11 to 17 inclusive with 85% kill at No. 5 and 7. (See Incl. 8).

(c) Particle (Droplet) size.

Line A - Particle size in microns varied from 242 microns at station No. 15 to 330 microns at station No. 7 to 13. 100% of all droplets recorded were below 800 microns. (See Incl. 8).

Line B - Particle size in microns varied from 132 microns at stations No. 17 to 220 microns at station No. 7 and 15. 100% of all particles recorded were below 800 microns. (See Incl. 8).

(d) Milligrams of DDT per Square Meter.

Line A - The number of milligrams of DDT per square meter varied from 1.4 mg to 56.9 mg. This was from station No. 1 to 17 inclusive, with the heaviest deposit at station No. 15. (See Incl. 9).

Line B - The number of milligrams of DDT per square meter varied from 4.4 mg to 38.1 mg. This was from station No. 1 to 17 inclusive, with the heaviest deposit at station No. 15. (See Incl. 9).

Test No. 5.- This test was conducted at an altitude of one hundred fifty (150) feet. S.C.I. contained 5% DDT in No. 2 fuel oil. The most effective portion of the pattern was two hundred fifty (250) yards wide on both lines A and B.

(a) Percentage of fly kill.

Line A - Stations on line A did not contain flies in cages. On this line, petrie dishes were contaminated by DDT spray, and flies were placed in these dishes in the laboratory. 100% of flies exposed to dishes from stations #3 to 11 were killed in fifteen (15) to fifty-one (51) minutes, with 100% kill at station #1 in one hundred forty-two (142) minutes. (See Incl. 8).

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Line B - Stations on line B contained both live flies in cages and petrie dishes. 100% of flies exposed to petrie dishes from stations #3 to 9 were killed in seventeen (17) to twenty-five (25) minutes with kill in excess of 73% in two hundred forty (240) minutes at station #1. The percentages of flies in cages that were killed varied from 97% to 100% from stations #1 to 11 inclusive. (See Incl. 8).

(b) Percentage of mosquito larvae kill.

Line A - The percentage of mosquito larvae kill was highest at stations #1, 5, 9, and 11. The kill at these stations varied from 60% to 100%. At station #3 the kill was only 15% and at stations #7 the kill was only 25%. (See Incl. 8).

Line B - The percentage of mosquito larvae kill was highest at stations #1 to 11. The kill varied from 70% to 100% at these stations. There was a 55% kill at station #13. (See Incl. 8).

(c) Particle (Droplet) size.

Line A - Particle size in microns varied from two hundred sixty (260) microns at station #3 to four hundred twelve (412) microns at station #9. (See Incl. 8). The size of practically all particles recorded was below six hundred (600) microns. (See Incl. 8).

Line B - Particle size in microns varied from one hundred fifty-two (152) microns at station #1 to eight hundred sixty-eight (868) at station #7. The size of practically all particles recorded varied from two hundred (200) to eight hundred (800) microns. (See Incl. 8).

(d) Milligrams of DDT per Square Meter.

Line A - The number of milligrams of DDT per square meter varied from 0.3 mg to 8.3 mg. This was from stations #1 to 11 inclusive, with the heaviest deposit at station #9. (See Incl. 9).

Line B - The number of milligrams of DDT per square meter varied from 4.7 mg. to 14.2 mg. This was from stations #1 to 13 inclusive, with the heaviest deposit at station #11. (See Incl. 9).

Test No. 6.- This test was conducted at an altitude of 150 feet. The S.C.I. contained 5% DDT in No. 2 fuel oil. The most effective portion of the pattern was between 200 and 250 yards wide at Line A and 300 yards wide at Line B for larvae but considerably less for flies in cages.

(a) Percentage of fly kill.

Line A - Stations on line A did not contain flies

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in cages. On this line, petrie dishes were contaminated by DDT spray, and flies were placed in these dishes in the laboratory. 100% of flies exposed to dishes from stations No. 1 to 11 were killed in 14 to 47 minutes. (See Incl. 8).

Line B - Stations on line B contained both live flies in cages and petrie dishes. 100% of flies exposed to dishes from stations No. 1 to 11 were killed in 14 to 47 minutes. (See Incl.8).

Line B - Stations on line B contained both live flies in cages and petrie dishes. 100% of flies exposed to dishes from stations No. 1 to 11 were killed in 12 to 85 minutes, station No. 9 excepted. 100% of flies in cages were killed at station No. 1 only. (See Incl. 8).

(b) Percentage of mosquito larvae kill.

Line A - The percentage of mosquito larvae kill was 100% at stations No. 1 to 5 inclusive, and 90% kill at stations No. 9, 11, and 17.

Line B - The percentage of mosquito larvae kill was 100% at stations No. 1 to 13 inclusive. (See Incl. 8).

(c) Particle (Droplet) size.

Line A - Particle size in microns varied from 132 microns at station No. 15 to 440 microns at station No. 1. All particles recorded were below 800 microns and most were below 600 microns. (See Incl. 8).

Line B - Particle size in microns varied from 110 microns at station No. 7 to 286 microns at station No. 3. All particles recorded were below 400 microns. (See Incl. 8).

(d) Milligrams of DDT per square meter.

Line A - The number of milligrams of DDT per square meter varied from 1.0 mg to 36.9 mg. This was from station No. 1 to 17 inclusive, with the heaviest deposit at station No. 3. (See Incl. 9).

Line B - The number of milligrams of DDT per square meter varied from 0.3 mg to 43.1 mg. This was from station No. 1 to 17 inclusive, with the heaviest deposit at station No. 1 (See Incl. 9).

Test No. 7.- This test was conducted at an altitude of one hundred fifty (150) feet. The S.C.I. contained 10% DDT in No. 2 fuel oil. The most effective portion of the pattern was two hundred (200) yards wide at both lines A and B (See Incl. 8).

(a) Percentage of fly kill.

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Line A - Stations on line A did not contain flies in cages. On this line, petrie dishes were contaminated by DDT spray, and flies were placed in these dishes in the laboratory. 100% of flies exposed to dishes from stations #1 to 11 were killed in nine (9) to one hundred thirteen (113) minutes. (See Incl. 8).

Line B - Stations on line B contained both live flies in cages and petrie dishes. 100% of flies exposed to dishes from stations #1 to 9 were killed in eight (8) to seventy-nine (79) minutes. The percentage of flies in cages that were killed was 100% at stations #1 to 7 inclusive, with 11% kill at station #9. (See Incl.8).

(b) Percentage of mosquito larvae kill.

Line A - The percentage of mosquito larvae kill was highest at stations #1 to 9. The kill at these stations varied from 75% to 100%. (See Incl. 8).

Line B - The percentage of mosquito larvae kill was highest at stations #1 to 9. The kill at these stations varied from 95% to 100% with 35% kill at station #9. (See Incl. 8).

(c) Particle (Droplet) size.

Line A - Particle size in microns varied from one hundred fifty-two microns at station #5 to four hundred thirty-four (434) microns at station #1. All particles recorded were below four hundred fifty (450) microns. (See Incl. 8).

Line B - Particle size in microns varied from one hundred fifty-two (152) microns at station #7 to six hundred fifty (650) microns at station #1. All particles recorded were below six hundred fifty-one (651) microns. (See Incl. 8).

(d) Milligrams of DDT per square meter.

Line A - The number of milligrams of DDT per square meter varied from 1.2 mg to 97 mg. This was from stations #1 to 17 inclusive, with the heaviest deposit at station #1. (See Incl. 9).

Line B - The number of milligrams of DDT per square meter varied from 0.3 mg to 50.9 mg. This was from stations #1 to 17 inclusive, with the heaviest deposit at station #3. (See Incl. 9).

Test No. 8.- This test was conducted at an altitude of 150 feet. The S.C.I. contained 10% DDT in #2 fuel oil with 20% Barrett's Heavy Solvent added as an auxiliary solvent. The wind direction shifted 90° at the time of the spray run and consequently the DDT spray was carried back along the length of the flight path and very little was deposited on the stations. (See Incl. 8).

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Test No. 9.- This test was conducted at an altitude of 150 feet. The S.C.I. contained 10% DDT in #2 fuel oil with 20% Barrett's Heavy Solvent, added as an auxiliary solvent. The most effective portion of the pattern was at stations No. 11, 13, and 17 on line A, and negligible on line B. On this run, the forward detonator did not fire and the S.C.I. tank trickled DDT solution for a considerable length of time as compared to the normal time of discharge. (See Incl. 8).

Test No. 10.- This test was conducted at an altitude of 50 feet. The S.C.I. contained 5% DDT in No. 2 diesel fuel oil. The most effective portion of the pattern was not more than 50 yards wide at line A and the same on line B.

(a) Percentage of fly kill.

Line A - 100% of flies exposed to petrie dishes from station No. 3 were killed in 102 minutes. (See Incl. 8).

Line B - 100% of flies exposed to petrie dishes were killed in 55 minutes at station No. 1 and 53 minutes at No. 3. The percentage of fliers in cages that were killed was 100% at station No. 1. (See Incl. 8).

(b) Percentage of mosquito larvae kill.

Line A - The percentage of mosquito larvae kill was 95% at station No. 3. (See Incl. 8).

Line B - The percentage of mosquito larvae kill was 95% at station No. 1. (See Incl. 8).

(c) Particle (Droplet) size.- Not enough particles were recorded to give any indication of particle size on this test. (See Incl. 8).

(d) Milligrams of DDT per square meter.

Line A - The number of milligrams of DDT per square meter was very low and varied from 0.2 mg to 1.0 mg. (See Incl. 9).

Line B - The number of milligrams of DDT per square meter was very low and varied from 0.2 mg to 1.1 mg. (See Incl. 9).

Test No. 11.- This test was conducted at an altitude of 50 feet. The S.C.I. contained 5% DDT in no. 2 diesel fuel oil. The most effective portion of the pattern was 50 yards wide on line A and the same on line B.

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(a) Percentage of fly kill.

Line A - 100% of flies exposed to petrie dishes were killed in 9 minutes at station No. 1 and 20 minutes at station No. 3. (See Incl. 8).

Line B - 100% of flies exposed to petrie dishes were killed in 28 minutes at station No. 1 and 110 minutes at station No. 3. The percentage of flies in cages that were killed was below 90% at all stations. (See Incl. 8).

(b) Percentage of mosquito larvae kill.

Line A - The percentage of mosquito larvae kill was 95% at station No. 1 and 5. (See Incl. 8).

Line B - The percentage of mosquito larvae kill was 100% at stations No. 1 and 3 with 90% kill at station No. 7. (See Incl. 8).

(c) Particle (Droplet) size.

Line A - Particle size in microns varied from 198 microns at station No. 1 to 66 microns at station No. 9. The size of all particles recorded was below 400 microns. (See Incl. 8).

Line B - Particle size in microns varied from 132 microns at station No. 1 to 88 microns at station No. 3. The size of all particles recorded was below 200 microns. (See Incl. 8).

(d) Milligrams of DDT per square meter.

Line A - The number of milligrams of DDT per square meter varied from 0.3 mg to 21.3 mg. This was from station No. 1 to 15 inclusive, with the heaviest deposit at station No. 1. (See Incl. 9).

Line B - The number of milligrams of DDT per square meter varied from 0.3 mg to 3.5 mg. This was from station No. 1 to 17 inclusive, with the heaviest deposit at station No. 1 (See Incl. 9).

Test No. 12.- This test was conducted at an altitude of 50 feet. The S.C.I. contained 10% DDT in No. 2 diesel fuel oil with 20% Barrett's Heavy Solvent added as an auxiliary solvent. The most effective portion of the pattern was 100 yards wide at both line A and 100 yards wide on line B.

(a) Percentage of fly kill.

Line A - 100% of flies exposed to petrie dishes were killed in 19 to 96 minutes. This was from stations no. 1 to 17

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inclusive. (See Incl. 8).

Line B - 100% of flies exposed to petrie dishes were killed in 22 to 108 minutes at stations No. 11 to 17 inclusive. 100% of flies in cages were killed at stations No. 13 to 17 inclusive. (See Incl. 8).

(b) Percentage of mosquito larvae kill.

Line A - The percentage of mosquito larvae kill was 100% at stations No. 1, 5, and 13, and 15, with 95% kill at stations No. 3 and 17. (See Incl. 8).

Line B - The percentage of mosquito larvae kill was 100% at stations No. 15 and 17 with 90% kill at station No. 13. (See Incl. 8).

(c) Particle (Droplet) size.

Line A - Particle size in microns varied from 154 microns at station No. 3 to 264 microns at station No. 13. The size of all particles recorded was below 400 microns. (See Incl. 8).

Line B - Particle size in microns varied from 88 microns at station No. 9 to 352 microns at station No. 17. The size of all particles recorded was below 600 microns. (See Incl. 8).

(d) Milligrams of DDT per square meter.

Line A - The number of milligrams of DDT per square meter varied from 0.2 mg to 3.5 mg. This was from stations No. 1 to 17 inclusive, with the heaviest deposit at station No. 1 and 15. (See Incl. 9).

Line B - The number of milligrams of DDT per square meter varied from 1.2 mg to 37.8 mg. This was from station No. 1 to 17 inclusive, with the heaviest deposit at station No. 17. (See Incl. 9).

Test No. 13.- This test was conducted at an altitude of 50 feet. The S.C.I. contained 10% DDT in No. 2 diesel fuel oil with 20% Barrett's Heavy Solvent added as an auxiliary solvent. The most effective portion of the pattern was 200 yards wide at line A and 250 to 300 yards wide on line B.

(a) Percentage of fly kill.

Line A - 100% of flies exposed to petri dishes were killed in 11 to 64 minutes. This was from station No. 7 to 17 inclusive. (See Incl. 8).

Line B - 100% of flies exposed to petri dishes were killed in 10 to 100 minutes. This was from station No. 1 to 17

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inclusive. (See Incl. 8). 100% of flies in cages were killed from station No. 7 to 17. (See Incl. 8).

(b) Percentage of mosquito larvae kill.

Line A - The percentage of mosquito larvae kill was 100% at station No. 11, 15, and 17 with 95% kill at station No. 9 and 13. (See Incl. 8).

Line B - The percentage of mosquito larvae kill was 100% at stations No. 7 to 17 excepting 11 where the kill was 70%. The kill was 90% at station No. 5. (See Incl. 8).

(c) Particle (Droplet) size.

Line A - Particle size in microns varied from 154 microns at station No. 5 to 374 microns at station No. 11. The size of all particles recorded was below 600 microns. (See Incl. 8).

Line B - Particle size in microns varied from 132 microns at station No. 3 and 13, to 352 microns at station No. 17. The size of all particles recorded was below 600 microns. (See Incl. 8).

(d) Milligrams of DDT per square meter.

Line A - The number of milligrams of DDT per square meter varied from 0.7 mg to 76.0 mg. This was from station No. 1 to 17 (No. 3 excepted), with the greatest deposit at station No. 17. (See Incl. 9).

Line B - The number of milligrams of DDT per square meter varied from 2.3 mg to 61.4 mg. This was from station No. 1 to 17 inclusive, with the greatest deposit at station No. 17. (See Incl. 9).

FOR THE ARMY AIR FORCES BOARD:

A. C. STRICKLAND
Brigadier General, U. S. Army
President

OFFICIAL:

Gustav A. Neuberg
GUSTAV A. NEUBERG
Lt. Colonel, AGD
Recorder

[redacted]